FHWA GIS Safety Analysis Tools
Version 4.0

User Guide

Prepared for

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Introduction

This document provides basic Installation and Execution instructions for the FHWA GIS Safety Analysis Tools Version 4.0 ArcGIS v9.1 Toolbar.

Requirements

For this extension to work, the following software must be installed on the local computer:

- Microsoft .Net Framework v1.1;
- ESRI ArcGIS 9.1; and,
- Crystal Reports version XI for ESRI.

Installation

Microsoft .Net Framework v1.1

The Microsoft .Net Framework is a software component which can be added to the Microsoft Windows operating system. It provides a large body of pre-coded solutions to common program requirements, and manages the execution of programs written specifically for the framework.

If necessary, the Microsoft .Net Framework version 1.1 redistributable package can be downloaded directly from the Microsoft website. Follow the instructions on this page on how to install the package.

Application

To install the FHWA GIS Safety Analysis Tools application:

1. Download the installation package ‘setup.msi’ from the FHWA website.
2. Double-click the ‘setup.msi’ installation package. An installation wizard will start to perform the install. Follow the instructions.

Several files will be installed in the destination directory (i.e., c:\Program Files\FHWA’):

1. FHWASafety.dll. The application.
2. OLEDBNet.dll. Extension to allow easier configuration of OLE Databases (i.e., MS SQL Server).
3. safety.mdb. A blank application database. The database can be copied and modified to reference project-specific data.
4. safety.mxt. A pre-defined Map template.
5. FHWA GIS Safety Analysis Tools v4 User Guide.
6. ADM v2.0 Data Dictionary

Execution

To open ArcGIS with the FHWA GIS Safety Analysis toolbar, either:

1. Open ArcMap.
2. Select 'File → Open…'. Using the File Dialog, select the ArcGIS Project (i.e., 'c:\safety\safety.mxd').
3. ArcGIS should open and load the Project.

Or:

1. Navigate to the appropriate Project folder (i.e., 'c:\safety').
2. Double-click the ArcGIS Project (i.e., 'c:\safety\safety.mxd').
3. ArcGIS should open and load the Project.

Functionality

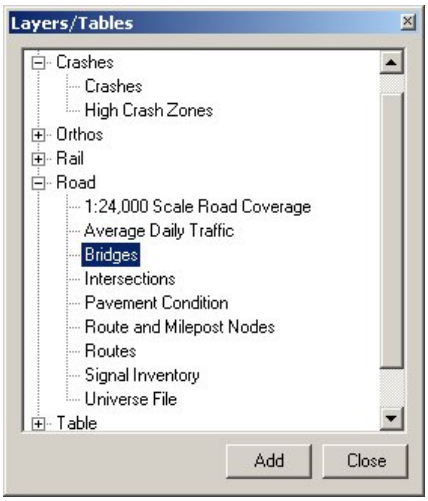
The following functionality was implemented as part of the Safety Tools application v4.0.

Display

Display Layer

This tool allows any of the Layers or Tables defined within the ADM Database to be opened and inserted into the current ArcGIS Project.

1. Click the 'Display Layer' tool on the 'FHWA GIS Safety' toolbar.
2. A Dialog is displayed showing all of the defined Layers and Tables in a Tree View.



3. Select the Layer/Table to open and press the 'Add' button. The selected Layer/Table will be opened and inserted into ArcMap.
4. Repeat step 3 until all of the required Layers/Tables have been opened.
5. To exit from the Dialog, press 'Close'.

Route / Station / Offset

This tool allows the Station and Offset of a Point relative to a selected Route to be displayed.

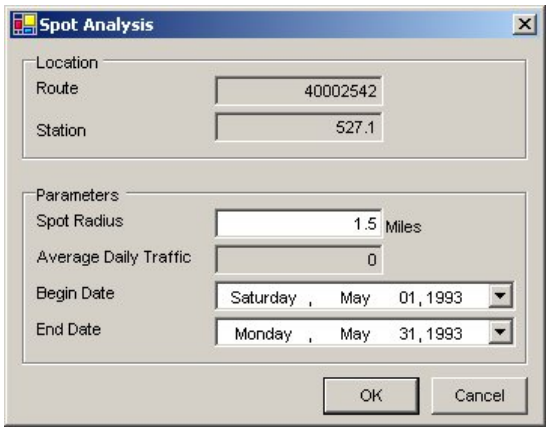
1. Click the 'RSO' tool on the 'FHWA GIS Safety' toolbar.
2. If necessary, the 'Routes' Layer is inserted to the Map.
3. Click on the Map at the desired Point.
4. If multiple Routes are selected, a Select Dialog is displayed allowing the correct Route to be selected.
5. The selected Route is then highlighted, a cross placed at the clicked Point, and the Station and Offset annotated next to the Point.

Analysis

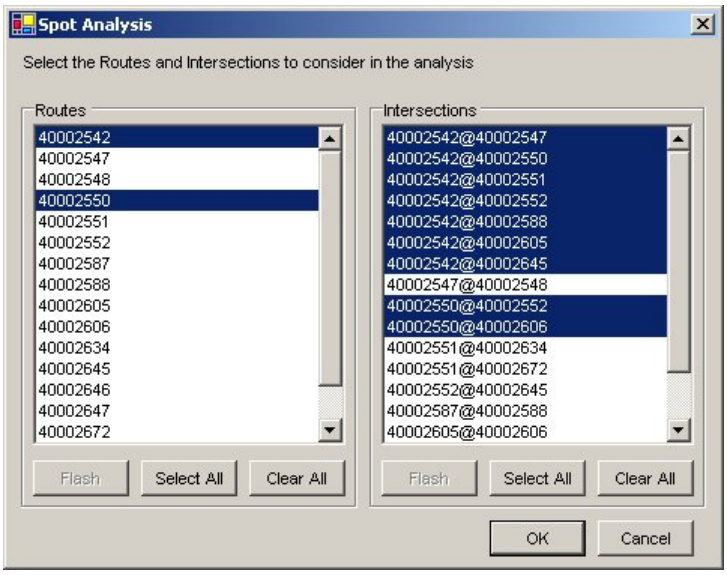
Spot Analysis

The Spot Analysis tool is used to analyze Crashes within a given Radius of a user-define Point.

1. Click the 'Spot Analysis' tool on the 'FHWA GIS Safety' toolbar.
2. If necessary, the 'Routes' Layer is inserted to the Map.
3. Click on the Map at the desired Point.
4. If multiple Routes are selected, a Select Dialog is displayed allowing the correct Route to be selected.
5. A Dialog is then displayed allowing the parameters of the Spot Analysis to be entered:
    a. Spot Radius – Radius of the circular buffer around the User Point.
    b. Begin Date – Date from which to analyze crashes.
    c. End Date – Date to which to analyze crashes.



   Once entered, press 'OK'.
6. The Spot Analysis Polygon is then generated and added to the Map as a graphic.
7. A Dialog is then displayed showing all of the Routes and Intersections within the defined Spot Analysis Polygon. Select the Routes and Intersections to consider in the analysis and then press 'OK'.

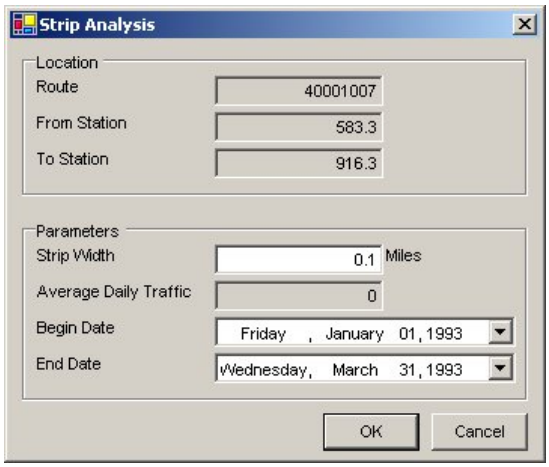


8. A Yes/No/Cancel Dialog is then displayed asking if the Intersection constraint is to be applied to any selected Mileposted Crashes. Press 'Yes' or 'No' as appropriate.
9. The Spot Analysis is then performed and the results (Crashes, Routes, Intersections, and Polygon) inserted into the Map as a Group Layer.

Strip Analysis

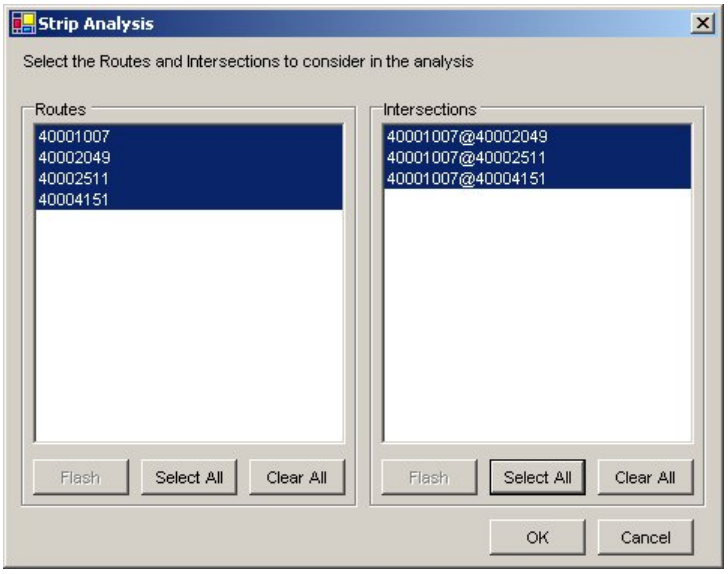
The Strip Analysis tool is used to analyze Crashes within a given distance of a user-defined Segment of a Route.

1. Click the 'Strip Analysis' tool on the 'FHWA GIS Safety' toolbar.
2. If necessary, the 'Routes' Layer is inserted to the Map.
3. Click on the Map to select the Route. If multiple Routes are selected, a Select Dialog is displayed allowing the correct Route to be selected. Once selected, the Route is highlighted.
4. Click on the selected Route to define one end of the Strip. A cross is placed on the Route to define the end.
5. Click on the selected Route to define the other end of the Strip. A cross is placed on the Route to define the end.
6. A Dialog is then displayed allowing the parameters of the Strip Analysis to be entered:
    a. Strip Width – Width of the Strip to generate.
    b. Begin Date – Date from which to analyze crashes.
    c. End Date – Date to which to analyze crashes.



Once entered, press ‘OK’.

7. The Strip Analysis Polygon is then generated and added to the Map as a graphic.
8. A Dialog is then displayed showing all of the Routes and Intersections within the defined Strip Analysis Polygon. Select the Routes and Intersections to consider in the analysis and then press ‘OK’.

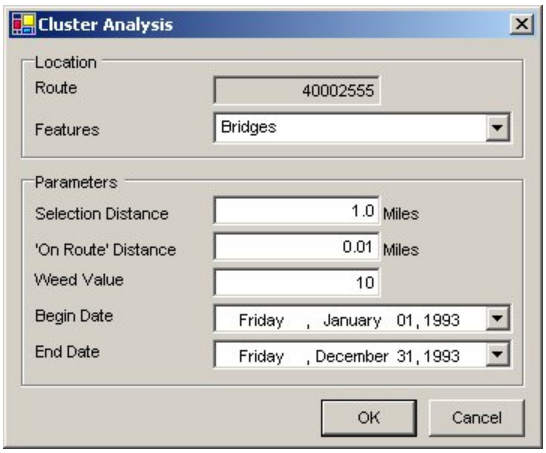


9. A Yes/No/Cancel Dialog is then displayed asking if the Intersection constraint is to be applied to any selected Mileposted Crashes. Press ‘Yes’ or ‘No’ as appropriate.
10. The Strip Analysis is then performed and the results (Crashes, Routes, Intersections, and Polygon) inserted into the Map as a Group Layer.

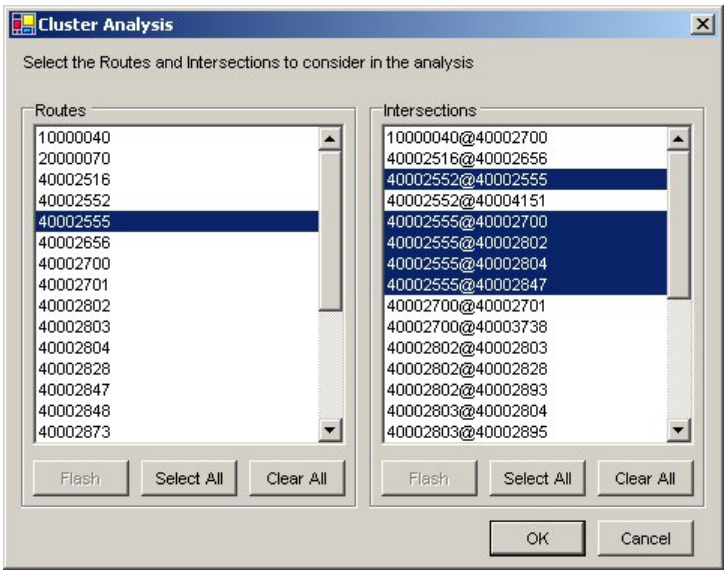
Cluster Analysis

The Cluster Analysis tool is used to analyze Crashes within a given distance of a particular Feature type (i.e., Bridges) along a Route.

1. Click the 'Cluster Analysis' tool on the 'FHWA GIS Safety' toolbar.
2. If necessary, the 'Routes' Layer is inserted to the Map.
3. Click on the Map to select the Route. If multiple Routes are selected, a Select Dialog is displayed allowing the correct Route to be selected. Once selected, the Route is highlighted.
4. A Dialog is then displayed allowing the parameters of the Cluster Analysis to be entered:
    a. Features - The Features against which to perform the analysis.
    b. Selection Distance – The distance to buffer around the Features on the selected Route.
    c. 'On Route' Distance – The distance within which a Feature is considered to be on the selected Route.
    d. Weed Value – Number of Crashes within the selection distance of a Feature that need to exist before the Feature is included in the analysis results.
    e. Begin Date – Date from which to analyze crashes.
    f. End Date – Date to which to analyze crashes.



    Once entered, press 'OK'.
5. The Cluster Analysis Polygons are then generated around each of the selected Features within the selection distance of the Route.
6. A Dialog is then displayed showing all of the Routes and Intersections within the defined Cluster Analysis Polygons. Select the Routes and Intersections to consider in the analysis and then press 'OK'.

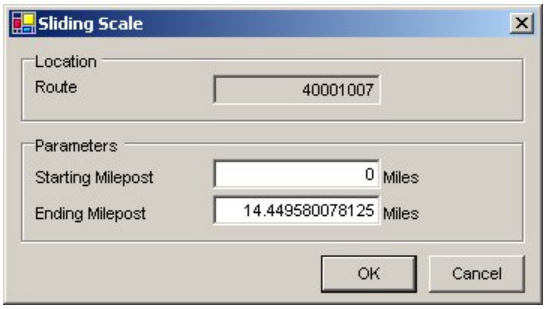


7. A Yes/No/Cancel Dialog is then displayed asking if the Intersection constraint is to be applied to any selected Mileposted Crashes. Press ‘Yes’ or ‘No’ as appropriate.
8. The Cluster Analysis is then performed and the results (Crashes, Routes, Intersections, and Polygons) inserted into the Map as a Group Layer.

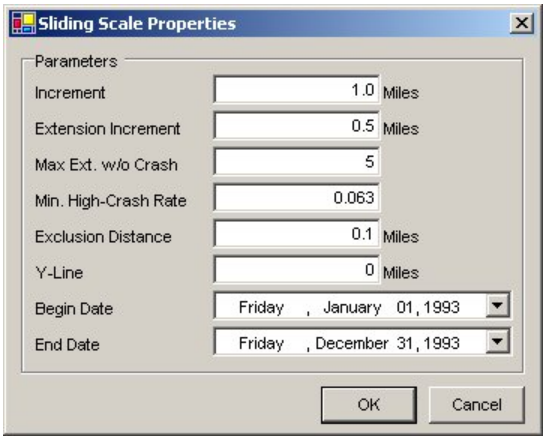
Sliding Scale Analysis

The Sliding Scale Analysis tool was implemented based on the paper ‘Evaluation of Truck Crashes Using a GIS-based Crash Referencing and Analysis System’, David L. Harkey, Transportation Research Record 1686.

1. Click the ‘Sliding Scale Analysis’ tool on the ‘FHWA GIS Safety’ toolbar.
2. If necessary, the ‘Routes’ Layer is inserted to the Map.
3. Click on the Map to select the Route. If multiple Routes are selected, a Select Dialog is displayed allowing the correct Route to be selected. Once selected, the Route is highlighted.
4. A Dialog is then displayed allowing the analysis extent for the select Route to be confirmed/entered. By default, the full extent of the Route is shown. Once confirmed/entered, press ‘OK’.



5. A Dialog is then displayed allowing the parameters of the Sliding Scale Analysis to be entered:
    a. Increment – Starting Segment Length.
    b. Extension Increment – Extension length to extend or slide along the Route.
    c. Max Ext. w/o Crash – Maximum number of extended lengths without a crash that would be allowed before a new segment starting point would be established.
    d. Min. High-Crash Rate – Minimum threshold crash rate, per million vehicle miles, used to determine if an analysis segment is a high-crash segment. This field is defaulted to the average crash rate for the type of route selected.
    e. Exclusion Distance – Distance beyond any intersections found along the route where a new segment will begin if intersections are to be excluded from the analysis. Set to zero if intersections are to be included.
    f. Y-Line – Distance along any intersecting routes from the route being analyzed to be included in the analysis.
    g. Begin Date – Date from which to analyze crashes.
    h. End Date – Date to which to analyze crashes.



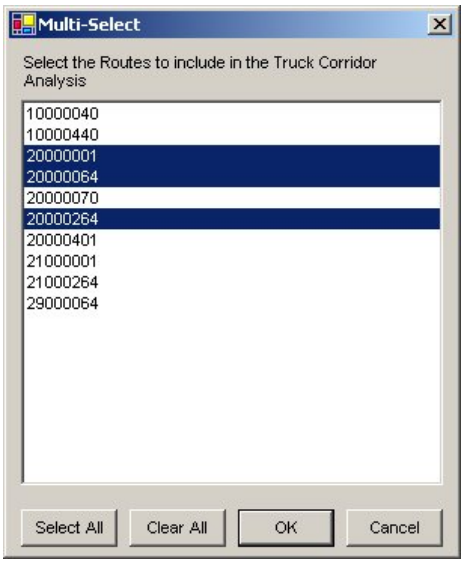
Once all of the parameters are entered, press OK.

6. The Sliding Scale Analysis is then performed and the results (Crashes, Sliding Scale results, Intersections, and Y-Line Polygon) inserted into the Map as a Group Layer.

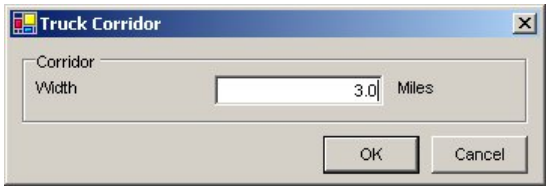
Truck Corridor Analysis

Using the Sliding Scale Analysis methodology, designated Truck Routes can be analyzed.

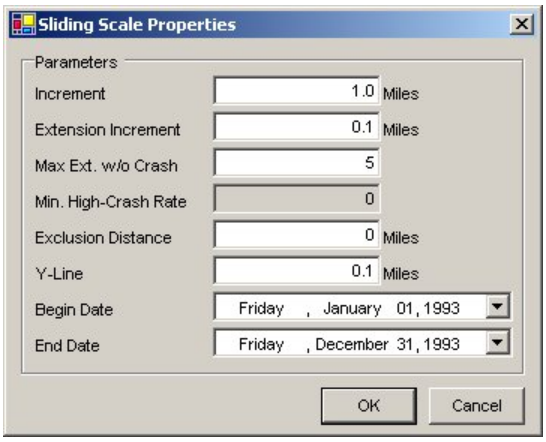
1. Click the 'Truck Corridor Analysis' tool on the 'FHWA GIS Safety' toolbar.
2. If necessary, the 'Truck Routes' Layer is inserted to the Map.
3. A Dialog is displayed allowing the user to select the Truck Route(s) to analysis. Once the Routes have been selected, press 'OK'.



4. A Dialog is then displayed allowing the width of the Truck Corridor to be defined.



5. A Dialog is then displayed allowing the parameters of the Sliding Scale Analysis to be entered:
    a. Increment – Starting Segment Length.
    b. Extension Increment – Extension length to extend or slide along the Route.
    c. Max Ext. w/o Crash – Maximum number of extended lengths without a crash that would be allowed before a new segment starting point would be established.
    d. Min. High-Crash Rate – As the Functional Classification for the Routes within the Truck Route buffer will be different, for this analysis the appropriate Functional Classification Average Crash Rate for each Route within the buffer will be used.
    e. Exclusion Distance – Distance beyond any intersections found along the route where a new segment will begin if intersections are to be excluded from the analysis. Set to zero if intersections are to be included.
    f. Y-Line – Distance along any intersecting routes from the route being analyzed to be included in the analysis.
    g. Begin Date – Date from which to analyze crashes.
    h. End Date – Date to which to analyze crashes.



Once all of the parameters are entered, press OK.

6. The Truck Corridor Analysis is then performed and the results (Crashes, Sliding Scale results, Intersections, Y-Line Polygon and Truck Corridor Buffer Polygon) inserted into the Map as a Group Layer.

Crash Locations

Unlocate Crash

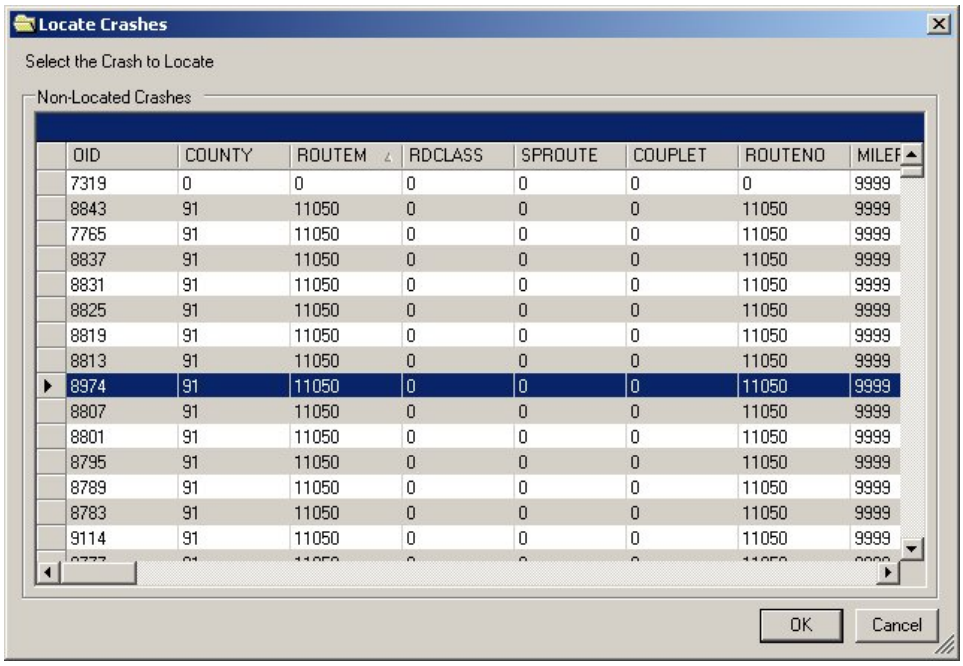
Some Crashes contained within the database may be at the wrong location. This Tool resets the location information for a Crash.

1. Click the ‘Unlocate Crash’ tool on the ‘FHWA GIS Safety’ toolbar.
2. If necessary, the ‘Crashes’ Layer is inserted to the Map.
3. Click on the Map to select the Crash to ‘unlocate’.
4. A Yes/No Dialog is displayed asking to confirm the ‘unlocation’ for the selected Crash. If ‘Yes’ is clicked, both the Route ID and the Milepost/Station for the Crash will be reset.

Locate Crash

Many Crashes contained within the database have no location information. This Tool sets the location information for a Crash.

1. Click the ‘Locate Crash’ tool on the ‘FHWA GIS Safety’ toolbar.
2. If necessary, the ‘Crashes’ Layer is inserted to the Map.
3. A Dialog is displayed showing the attributes of all of the Crashes. Select the Crash to location and click ‘OK’.



4. Click on the Map to define the location of the selected Crash.
5. A Yes/No Dialog is displayed asking to confirm the 'location' for the selected Crash. If 'Yes' is clicked, both the Route ID and the Milepost/Station for the Crash will be set.

Tools…

The Toolbar contains several general purpose functions.

Reload Analysis

The results of the Crash Analysis tools are stored as Shapefiles within the defined Output directory. This tool allows any of the Analysis results to be reloaded.

1. Click the 'Reload Analysis' command on the 'FHWA GIS Safety' toolbar 'Tools' menu.
2. A File Dialog is displayed allowing the Crash Shapefile to be selected.
3. The Crash, Route, Intersection and Polygon Shapefiles are then opened and inserted into the Map as a Group Layer.

Display

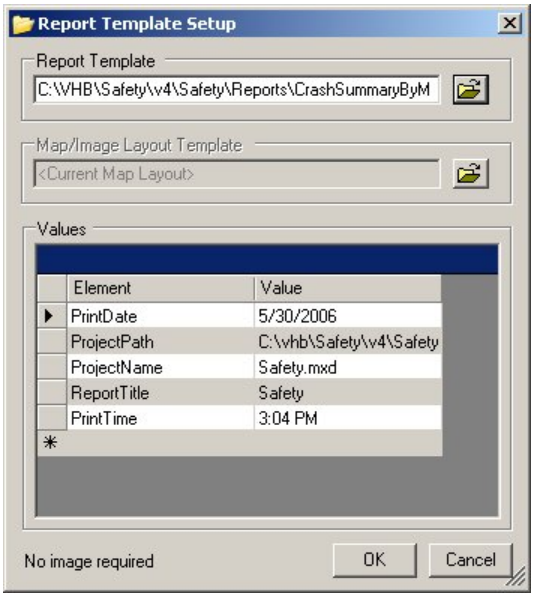
This tool allows any electronic files (i.e., Crash Reports, Video Logs) to the opened and displayed.

1. Click the 'Display' command on the 'FHWA GIS Safety' toolbar 'Tools' menu.
2. A File Dialog is displayed allowing the file to be selected.
3. If the File is of a known type for the Operating System, it is opened and displayed using the default application.

Report

Custom reports can be generated using the Crystal Reports engine bundled with ArcGIS.

1. Select (highlight) the single Layer (not a Group Layer) in the Table of Contents from which the report is to be generated.
2. Click the 'Report' command on the 'FHWA GIS Safety' toolbar 'Tools' menu.
3. A Dialog is displayed allowing the parameters of the Report to be set:
   a. Report Template – The Crystal Reports template (.rpt) that defines the format and data groupings for the report.
   b. Map Template – If a Map is to be included in the Report, this parameter allows the user to select the Map Template (.mxt)
   c. Values – Additional values that can be included within the Report.



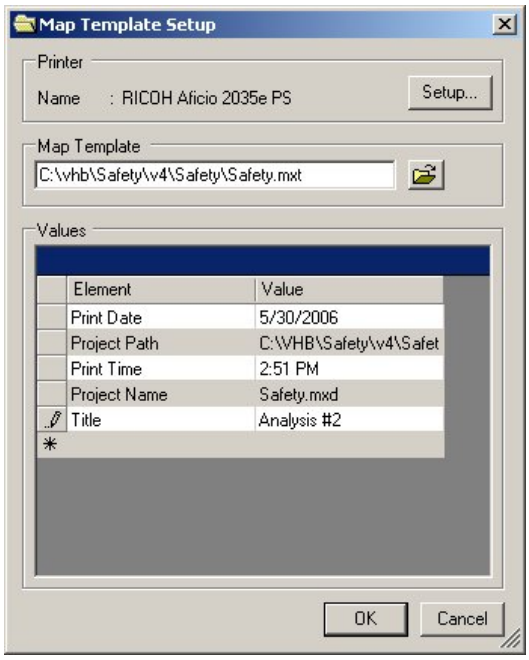
   Once all of the parameters are entered, press OK.
4. The Report is then generated and displayed in a new window.

Note: When a new report template is selected, the Toolbar checks to see if a Map is included within the Report. If so, the 'Map Template' edit line is activated.

Map Template

Custom maps can be generated using the predefined Map Templates.

1. Click the 'Map Template' command on the 'FHWA GIS Safety' toolbar 'Tools' menu.
2. A Dialog is displayed allowing the parameters of the Map to be set:
   a. Printer – The printer on which the Map is to be produced.
   b. Map Template – Allows the user to select the Map Template (.mxt)
   c. Values – Additional values that can be included within the Map.



Once all of the parameters are entered, press OK.

3. The Map is then generated and displayed.

ADM Setup

Manages the ADM Database. To access the ADM Setup tool:

1. Click the 'ADM Setup' command on the 'FHWA GIS Safety' toolbar 'Tools' menu.

For specific information about using this tool, refer to 'Appendix B – ADM Setup'.

Database Connection

Change the Connection to the active Database.

1. Click the 'Database Connection' command on the 'FHWA GIS Safety' toolbar 'Tools' menu.
2. The 'Database Connection' dialog will be displayed:

3. Either type in the Path and Name of the ADM database (i.e., 'c:\VHB\MyProj\adm.mdb') or use the Browse button.
4. Once selected, press the 'OK' button.

Appendix A - New Project Setup

To provide a high level of configurability, the FHWA GIS Safety tools application uses the ArcGIS Data Manager (ADM) to manage all of the data used within the application. The ADM consists of a number of related tables stored within a Microsoft Access database. These tables define all of the Feature Classes, Tables, Layers and related data accessible by the FHWA GIS Safety tools application. For a detailed description of the ADM, refer to the document 'ArcGIS Data Manager Version 2.0 Data Dictionary'.

Note: It is assumed that the user setting up the new Project ADM database is familiar with ArcGIS and how to load, join, linear reference and classify data.

Initialization

To initialize the database for a new Project:

1. Create a new Project directory (i.e., 'c:\safety').
2. Copy the ADM database 'safety.mdb' and the Map template ('safety.mxt') from the application installation directory (i.e., 'c:\Program Files\FHWA') to the new Project directory.
3. Open ArcGIS.
4. The FHWA GIS Safety toolbar should load automatically. If not, select 'View → Toolbars → FHWA Safety Analysis'.
5. Save the blank ArcGIS Project into the Project directory (i.e., 'c:\safety\safety.mxd').
6. Select the 'Tools → Database Connection' menu option on the 'FHWA Safety Analysis' toolbar. The 'Database Connection' dialog will be displayed:

7. Either type in the Path and Name of the ADM database (i.e., 'c:\safety\safety.mdb') or use the Browse button. Once selected, press the 'OK' button.
8. Resave the updated ArcGIS Project into the project directory (i.e., 'c:\safety\safety.mxd').

Data Reference

For the FHWA GIS Safety Tools application to function successfully, several Layers need to be correctly defined (i.e., Routes, Crashes, etc.), while other Layers are optional but provide background and reference data. These Layers are defined within the ADM database and are based upon defined Feature Classes and Attribute Tables.

Note: For examples on referencing the Feature Classes, Tables and Layers, refer to the ADM database contained with any of the example datasets.

Feature Classes

The FHWA GIS Safety tools application requires four Feature Class references to be setup within the 'ADMFeatureClass' Table in the ADM database.

Tag	Feature Class Type	Description
Routes	Measured Polylines (PolylineM)	Feature Class used to display the Routes. Must contain a unique ID (Primary Key) field that is defined as the 'Key Field' for this Feature

		Class.
Intersections	Measured Polylines (PolylineM)	Route System used to display Intersections within the analysis area. Must contain a unique ID (Primary Key) field that is defined as the 'Key Field' for this Feature Class.
Crashes	Measured Polylines (PolylineM)	Route System used to display Crashes within the analysis area. Must contain a unique ID (Primary Key) field that is defined as the 'Key Field' for this Feature Class.
Univ	Measured Polylines (PolylineM)	Route System used to display Universe File (i.e., ADT) within the analysis area. Must contain a unique ID (Primary Key) field that is defined as the 'Key Field' for this Feature Class.

Note: As Routes, Intersections, Crashes and Univ are normally displayed against the same Route System, these four Feature Class references will normally reference the same Route System.

These references can be entered either manually by opening the ADM database in Microsoft Access and editing the 'ADMFeatureClass' Table, or using the 'ADM Setup' functionality (see ' Appendix B – ADM Setup', '5 – ADM Feature Class').

Tables

The FHWA GIS Safety tools application requires three Event Table references to be setup within the 'ADMTable' Table in the ADM database.

Tag	Table Type	Description
Intersections	Point Event	Each defined Intersection within the analysis area. The Intersections must be defined as Point Events against the 'Intersections' Feature Class. The Feature Class must contain fields for defining the 2 Routes that intersect at the Intersection that link to the ID field in the Routes Layer.
Crashes	Point Event	Defines the location of all of the Crash to be analyzed by the application. The Crashes must be defined as Point Events against the 'Crashes' Feature Class.
Univ	Linear Event	Defines the ADT for all stretches of the Routes. They must be defined as Linear Events against the 'Univ' Feature Class.

These references can be entered either manually by opening the ADM database in Microsoft Access and editing the 'ADMFeatureClass' Table, or using the 'ADM Setup' functionality (see ' Appendix B – ADM Setup', '6 – ADM Table').

Layers

The FHWA GIS Safety tools application requires eleven Layer references to be setup within the 'ADMLayer' Table in the ADM database.

Tag	Feature Class Based on	Key Field	Description
Routes	Routes	Route ID Field	Route Layer
Intersections	Intersections	Intersection ID Field	Each defined Intersection within the analysis area
Crashes	Crashes	-	Defines the location of all of the Crash to be analyzed by the application
Univ	Univ	-	Defines the ADT for all stretches of the Routes
Crash Analysis : Corridor	-	-	Predefined. Definition to use when displaying Corridors in Crash Analysis results.
Crash Analysis : Crashes	-	-	Predefined. Definition to use when displaying Crashes in Crash Analysis results.
Crash Analysis :	-	-	Predefined. Definition to use when displaying

Intersection			Intersections in Crash Analysis results.
Crash Analysis : Polygon	-	-	Predefined. Definition to use when displaying Polygons in Crash Analysis results.
Crash Analysis : Routes	-	-	Predefined. Definition to use when displaying Routes in Crash Analysis results.
Crash Analysis : Sliding Scale Crash Zones	-	-	Predefined. Definition to use when displaying Crash Zones in Crash Analysis results.

These references can be entered either manually by opening the ADM database in Microsoft Access and editing the 'ADMFeatureClass' Table, or using the 'ADM Setup' functionality (see ' Appendix B – ADM Setup', '7 – ADM Layer').

Initialization Parameters

To allow the FHWA GIS Safety application to 'understand' the data that it is accessing, several initialization parameters need to be set in the 'ADMSetup' table.

Parameter	Description	Example Setting
Client	Name of the ADM Client	VHB
Output Folder	Path and Name of the output folder for storing Analysis results	$PROJ\output
Display Filter	Name and Filter (separated by '|' character) to be used when displaying Files. This Parameter may appear multiple times to allow for multiple filters to be entered	Crash Reports (*.tif)|*.tif Images (*.jpg)|*.jpg
Crash Date Field	Name of the Field in the 'Crashes' Layer that stores the Date of the Crash (must be a field of type 'Date')	CrashDate
Crash Intersection Route 1 Field	Name of the Field in the 'Crashes' Layer that stores the ID of Route #1 at the Intersection	RefRoad
Crash Intersection Route 2 Field	Name of the Field in the 'Crashes' Layer that stores the ID of Route #2 at the Intersection	RoadOn
Univ ADT Field	Name of the 'ADT' Field in the 'Univ' Layer	AveDailyTraf
Measure Length MFactor	Multiplication Factor used to convert Route measure units to Miles.	0.01
Average Crash Rate Interstate	Average Interstate Crash Rate per Million Vehicles Miles	0.104
Average Crash Rate US	Average US Route Crash Rate per Million Vehicles Miles	0.088
Average Crash Rate Primary	Average Primary Routes Crash Rate per Million Vehicles Miles	0.086
Average Crash Rate Secondary	Average Secondary Routes Crash Rate per Million Vehicles Miles	0.063
Route Interstate	Definition Query used to select Interstates from the 'Routes' Layer	TY = 1
Route US	Definition Query used to select US Routes from the 'Routes' Layer	TY = 2
Route Primary	Definition Query used to select Primary Routes from the 'Routes' Layer	TY = 3
Route Secondary	Definition Query used to Secondary Routes from the 'Routes' Layer	TY = 4
Version	ADM Version	2.0

These references can be entered either manually by opening the ADM database in Microsoft Access and editing the 'ADMSetup' Table, or using the 'ADM Setup' functionality (see 'Appendix B – ADM Setup', '1 – ADM Setup').

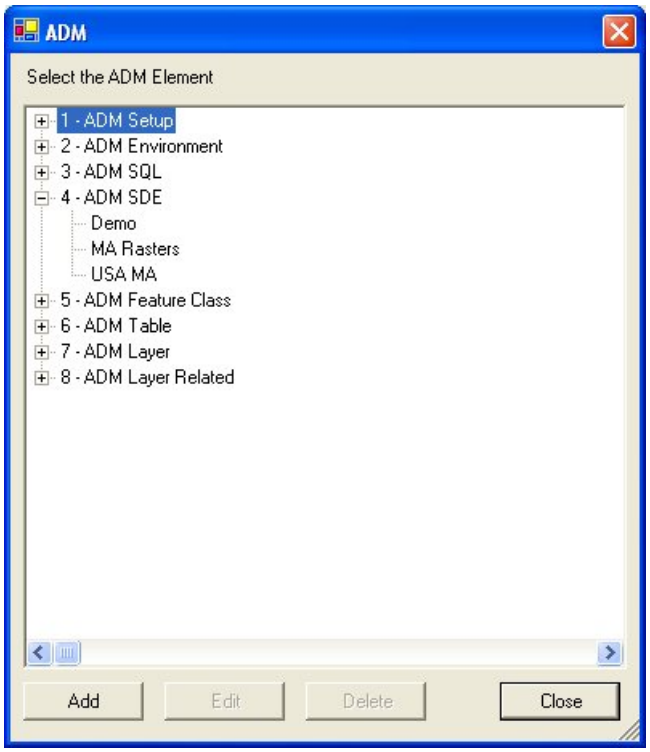
Appendix B – ADM Setup

The ADM (ArcView Data Manager) Setup Tool provides a way to manage the ADM database that contains references about all data used in the project. The database is broken out into eight Elements:

1. ADM Setup – Initialization parameters.
2. ADM Environment – Environment variables.
3. ADM SQL – SQL database connections.
4. ADM SDE – ArcSDE database connections.
5. ADM Feature Class – Spatial data
6. ADM Table – Attribute data.
7. ADM Layer – Map Layers.
8. ADM Layer Related – Many-to-one data relationships.

All ADM maintenance events are initiated from the main ADM Setup Dialog.

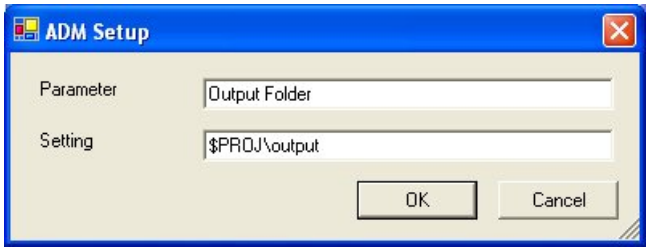
- Add – Adds a new reference to the selected ADM Element.
- Edit – Edit the selected ADM Element reference.
- Delete – Removes the selected ADM Element reference from the ADM database.



1 – ADM Setup

The ADM Setup dialog provides the ability to set a Parameter and its corresponding Setting.

- Parameter – The name of the Parameter.
- Setting – The value that corresponds to the Parameter.



Note: To maintain system stability, the two Parameters 'Client' and 'Version' cannot be edited.

2 – ADM Environment

The ADM Environment dialog provides the ability set a dynamic path Variable and its corresponding Value.

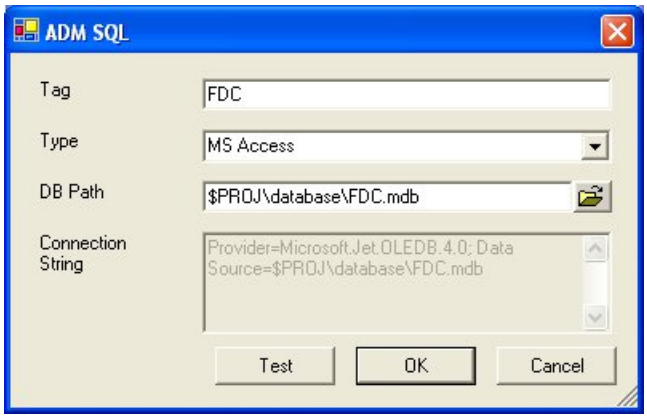
- Variable – The name of the Variable. Note: It is required that this name begin with a dollar sign ('$') and contain no spaces.
- Value – The directory path that the Variable corresponds to.

Note: The '$PROJ' variable can not be edited since it is related to the path of current ArcMap Project file and is dynamically set.

3 – ADM SQL

The ADM SQL dialog provides the ability set the SQL Connection properties.

- Tag – This is used for reference purposes and must be unique.
- Type – The type of SQL Connection.
- DB Path – The path to the MS Access database if Type = 'MS Access'.
- Connection String – The actual ADO Connection String that is used to connect to the database.
    - If Type 'MS Access' is selected, the Connection String is created automatically and not editable.
    - For other Types, the Connection String must be modified to establish the connection.

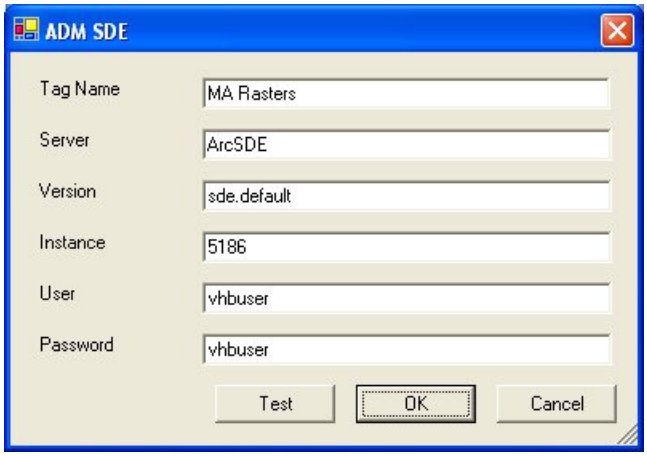


Click 'Test' to test the SQL connection with the current settings.
Click 'OK' to save the SQL connection properties to the ADM database.

4 – ADM SDE

The ADM SDE dialog provides the ability to set the SDE Server Connection Properties. All fields are required.

- Tag – Used for reference purposes. Must be unique.
- Server – The name of the ArcSDE Server to connect to.
- Version – The Version of the database to connect to. In most cases this will be 'sde.default'
- Instance – The Instance number to use for the connection.
- User – A valid user name that has access to the SDE Server instance.
- Password – A valid password that corresponds to the User name.



Click 'Test' to test the connection with the current settings and indicates whether the test was successful.
Click 'OK' to save the connection properties to the ADM database.

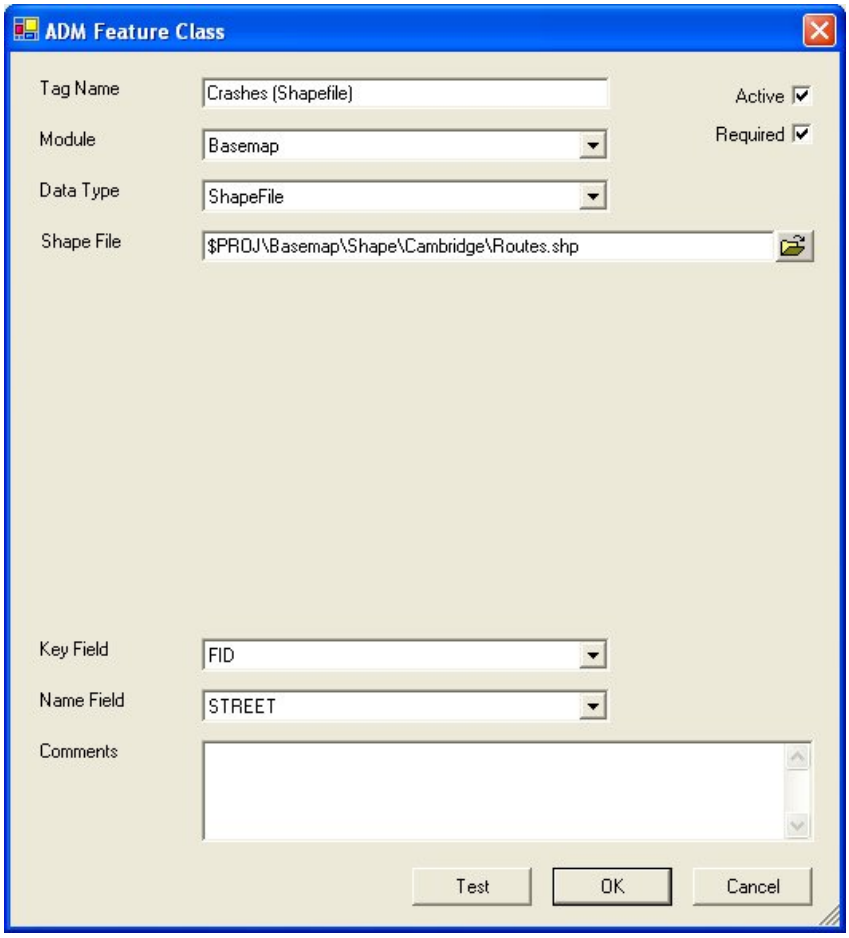
5 – ADM Feature Class

The ADM Feature Class Dialog provides the ability to define all of the Spatial data (Feature Classes) that can be accessed by the Project.

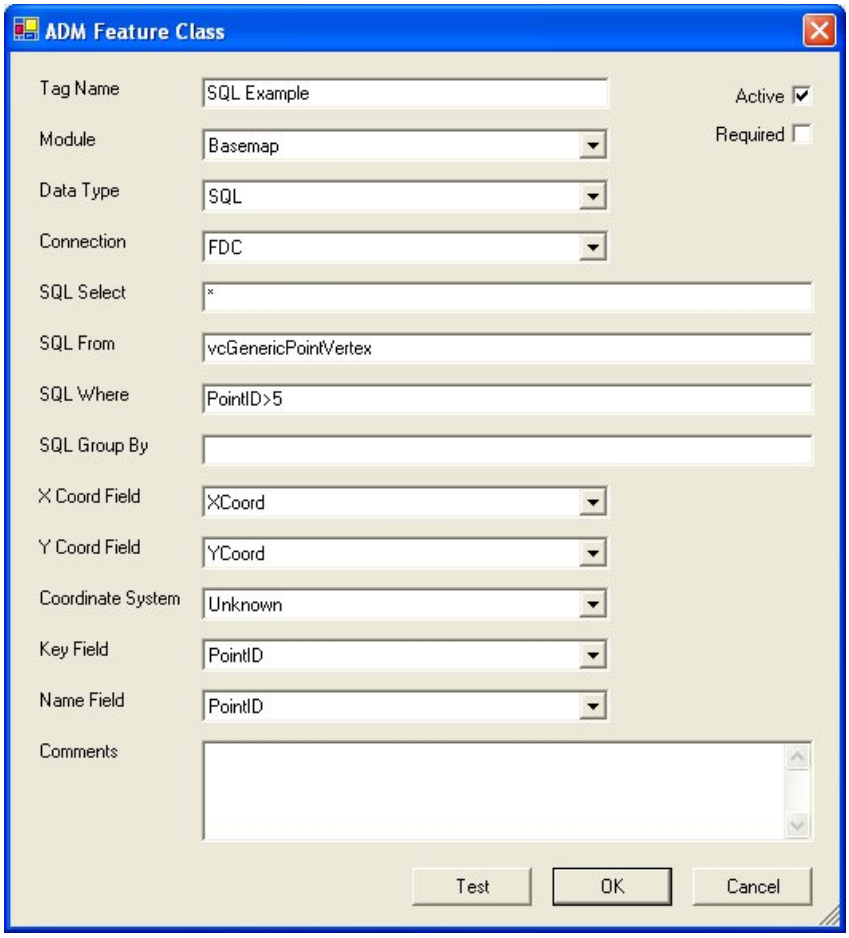
Note: Depending upon the type of the Feature Class selected, the actual required and optional data fields will vary.

- Tag – Used for reference purposes. Must be unique.
- Module – The Module with which to associate the ADM Feature Class.
- Data Type – The type of the ArcGIS Workspace that contains the Feature Class.
- Shapefile – (ArcInfo, dBase, File, Raster, SDC & Shapefile Only) Path and Name of the appropriate file.
- Connection – (SQL Only) Name of the defined ADM SQL Connection.
- SQL Select – (SQL Only) Select portion of the SQL statement that defines which fields to retrieve.
- SQL From – (SQL Only) The Table or View from which the data is retrieved.
- SQL Where – (SQL Only) (Optional) The Where Clause that defines the filter for the data.
- SQL Group By – (SQL Only) (Optional) Name(s) of the field(s) by which the data should be grouped.
- SDE Connection – (SDE Only) Name of the defined ADM SDE Connection.
- SDE Data Source – (SDE Only) Name of the Feature Class available via the selected SDE Connection.
- X Coord Field – (dBase, File or SQL) The field in the dataset that defines the X Coordinate.
- Y Coord Field – (dBase, File or SQL) The field in the dataset that defines the Y Coordinate.
- Coordinate System – (Optional) The Coordinate System of the data.
- Key Field – (Not Raster) (Optional) The name of the unique field to use as the key for each Feature in the Feature Class.
- Name Field – (Not Raster) (Optional) The name of the field to use as the name for each Feature in the Feature Class.
- Comments – (Optional) Any additional information to record about the ADM Feature Class.
- Active – Is the ADM Feature Class active?
- Required – Is this ADM Feature Class required for the Project to function correctly?

If a file based Feature Class (i.e., ArcInfo, dBase, File, Raster, SDC, Shapefile) is selected, a Dialog similar to the one below will be displayed.



If an SQL Data Type is selected, the following Dialog will be displayed.



Note: To retrieve and refresh the available fields for the X and Y Coordinates and Key/Name Fields, click the 'Test' button.

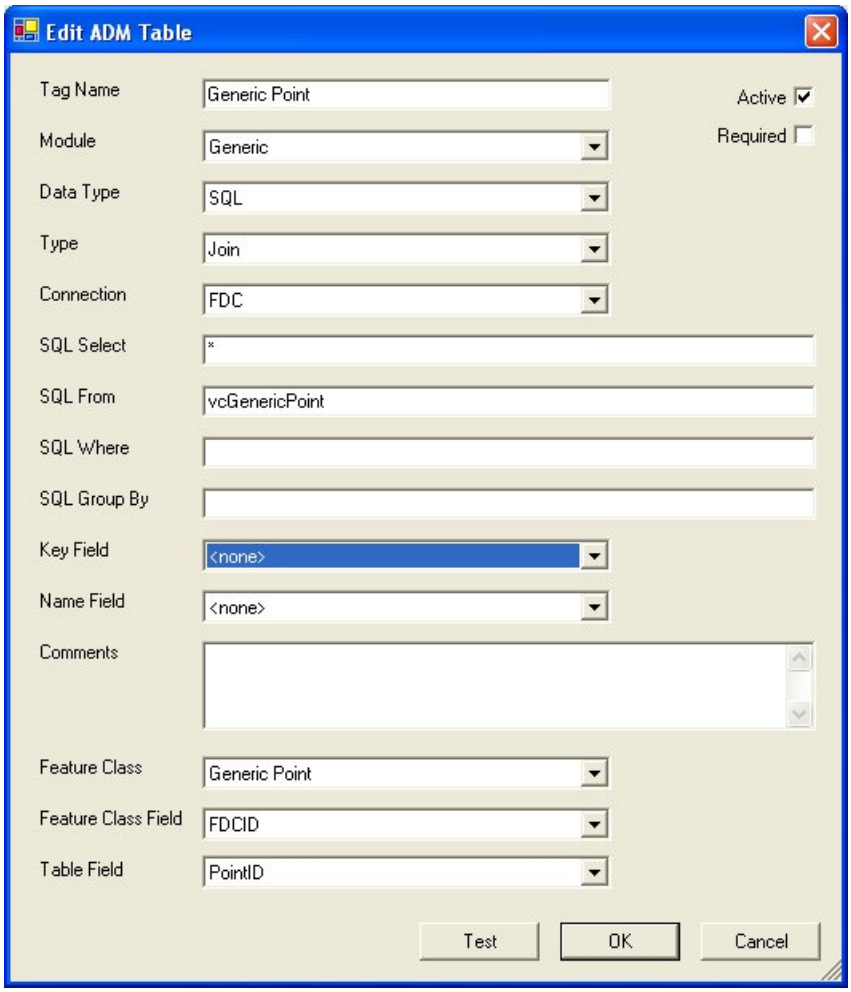
Click 'Test' to ensure that the Feature Class can be successfully retrieved.
Click 'OK' to save the Feature Class reference to the ADM database.

6 – ADM Table

The ADM Table dialog provides an interface for setting up table based data sources.

- Tag – Used for reference purposes. Must be unique.
- Module – The Module with which the ADM Table is associated.
- Data Type – The type of the ArcGIS Workspace that contains the Table.
- Data Type – The type of ADM Table. The following Types exist:
  - Attribute – A simple standalone table.
  - Join – The table is joined to a define ADM Feature Class.
  - Point Event – A table containing Point Events, linearly referenced against a Route System.
  - Linear Event – A table containing Linear Events, linearly referenced against a Route System.
- Connection – (SQL Only) Name of the defined ADM SQL Connection.

- SQL Select – (SQL Only) Select portion of the SQL statement that defines the fields to retrieve.
- SQL From – (SQL Only) The Table or View from which the data is retrieved.
- SQL Where – (SQL Only) (Optional) The Where Clause that defines the filter for the data.
- SQL Group By – (SQL Only) (Optional) Name(s) of the field(s) by which the data should be grouped.
- Key Field – (Optional) The name of the field to use as the key for each Table record.
- Name Field – (Optional) The name of the field to use as the name for each Table record.
- Comments – (Optional) Any additional information to record about the ADM Table.
- Active – Is the ADM Table active?
- Required – Is this ADM Table required for the Project to function correctly?



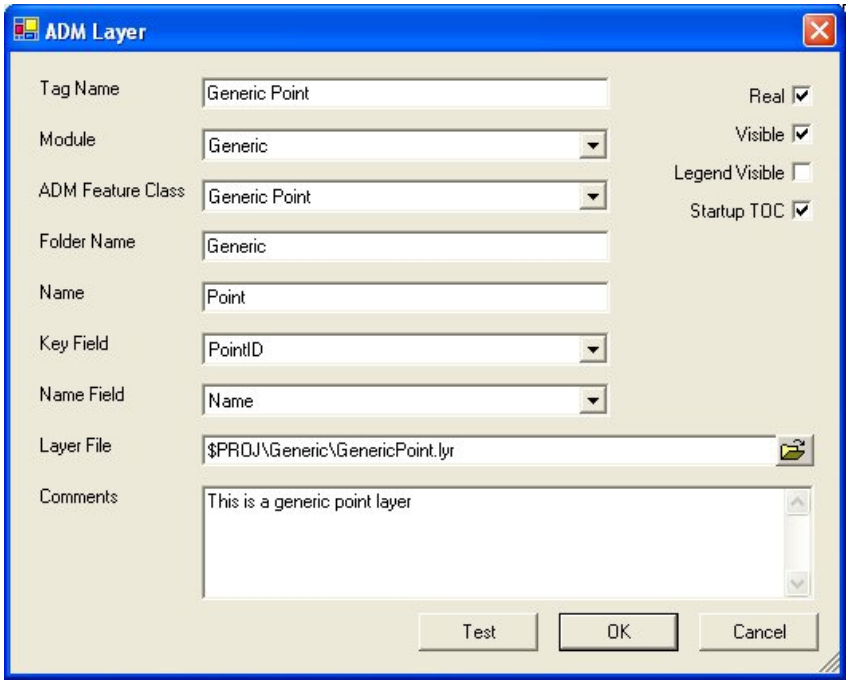
Note: To retrieve and refresh the available fields for the X and Y Coordinates and Key/Name Fields, click the 'Test' button.

Click 'Test' to ensure that the Table can be successfully retrieved.
Click 'OK' to save the Table reference to the ADM database.

7 – ADM Layer

The ADM Layer Dialog provides the ability to define all of the Layers that will be accessible by the Project.

- Tag – Used for reference purposes. Must be unique.
- Module – The Module with which associate the ADM Layer.
- ADM Feature Class – The ADM Feature Class upon which the Layer is based.
- Folder Name – The name of the folder (grouping) for the Layer when displayed in the 'Display Layer' Dialog.
- Name – The name of the Layer.
- Key Field – (Optional) The name of the field to use as the unique key for each Feature.
- Name Field – (Optional) The name of the field to use as the name for each Feature.
- Layer File – (Optional) Path and Name of the ArcMap Layer file (.lyr) used to classify the Features.
- Comments – (Optional) – Any additional information to record about the ADM Layer.
- Real – Does the ADM Layer reference refer to an existing Feature Class?
- Visible – Is the Layer visible on the Map when the Layer is displayed?
- Legend Visible – Is the Layer Legend visible in the Table of Contents when it is displayed?
- Startup TOC – Is the Layer Legend visible/active?

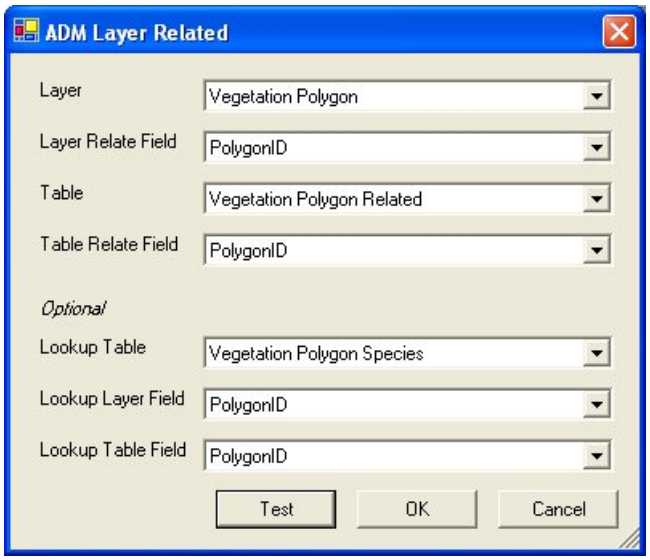


Click 'Test' to ensure that the data source can be successfully retrieved and that the Layer can be successfully formed and rendered in ArcMap.
Click 'OK' to save a reference to the ADM Layer to the ADM database.

8 – ADM Layer Related

ADM Layers can be related to any ADM Table by using this interface. Simply select the ADM Layer and the Table to join to and the fields to join. The relationship can be further extended by adding a Lookup table which can be joined to the parent Layer Related relationship.

- Layer – The ADM Layer.
- Layer Relate Field – The Field Name in the Layer that is used for the join,
- Table – The ADM Table to join.
- Table Relate Field – The name of the field in the Table that is used in the join.
- Lookup Table – (Optional) Name of the table that is used as a Lookup, if any,
- Lookup Layer Field – (Optional) The Field Name in the Layer Related that is used for the join.
- Lookup Table Field – (Optional) The name of the field in the Lookup Table that is used in the join.



Click ‘Test’ to ensure that both data sources can be successfully retrieved and that they can be joined using the selected fields.
Click ‘OK’ to save a reference to the ADM Layer Related record to the ADM database.